SEQUENCE LISTING

<110> Bertin, John

<120> NOVEL MOLECULES OF THE CARD-RELATED
PROTEIN FAMILY AND USES THEREOF

<130> 07334-142001

<140> 09/767,215
<141> 2001-01-22

<150> 60/181,159
<151> 2000-02-09

<160> 10

<170> FastSEQ for Windows Version 4.0

<210> 1
<211> 3931
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (207)...(3218)

<400> 1
attcggctcg agttcacctg gtgctgcttt gacttcaggc tcttccttct gcccagctcc   60
gtcccaccca gcagcccgca gagaaaggag gcagctggca ccacactggg ctttggagac   120
actgcgggga ctgtggaccc caccctgctg cacggagctc ctgcaaaagc aaacctgaga   180
accttgggtc ctcccagcgc ccagcc atg ggg gaa ctg tgc cgc agg gac tcc   233
                               Met Gly Glu Leu Cys Arg Arg Asp Ser
                                 1   5

gca ctc acg gca ctg gac gag gag aca ctg tgg gag atg atg gag agc   281
Ala Leu Thr Ala Leu Asp Glu Glu Thr Leu Trp Glu Met Met Glu Ser
 10   15   20   25

cac cgc cac agg atc gta cgc tgc atc tgc ccc agc cgc ctc acc ccc   329
His Arg His Arg Ile Val Arg Cys Ile Cys Pro Ser Arg Leu Thr Pro
                30   35   40

tac ctg cgc cag gcc aag gtg ctg tgc cag ctg gac gag gag gag gtg   377
Tyr Leu Arg Gln Ala Lys Val Leu Cys Gln Leu Asp Glu Glu Glu Val
            45   50   55

ctg cac agc ccc cgg ctc acc aac agc gcc atg cgg gcc ggg cac ttg   425
Leu His Ser Pro Arg Leu Thr Asn Ser Ala Met Arg Ala Gly His Leu
            60   65   70

ctg gat ttg ctg aag act cga ggg aag aac ggg gcc atc gcc ttc ctg   473
Leu Asp Leu Leu Lys Thr Arg Gly Lys Asn Gly Ala Ile Ala Phe Leu
         75   80   85

A1

```
gag agc ctg aag ttc cac aac cct gac gtc tac acc ctg gtc acc ggg      521
Glu Ser Leu Lys Phe His Asn Pro Asp Val Tyr Thr Leu Val Thr Gly
 90              95              100             105

ctg cag cct gat gtt gac ttc agt aac ttt agc ggt ctc atg gag aca      569
Leu Gln Pro Asp Val Asp Phe Ser Asn Phe Ser Gly Leu Met Glu Thr
                110             115             120

tcc aag ctg acc gag tgc ctg gct ggg gcc atc ggc agc ctg cag gag      617
Ser Lys Leu Thr Glu Cys Leu Ala Gly Ala Ile Gly Ser Leu Gln Glu
         125             130             135

gag ctg aac cag gaa aag ggg cag aag gag gtg ctg ctg cgg cgg tgc      665
Glu Leu Asn Gln Glu Lys Gly Gln Lys Glu Val Leu Leu Arg Arg Cys
         140             145             150

cag cag ctg cag gag cac ctg ggc ctg gcc gag acc cgt gcc gag ggc      713
Gln Gln Leu Gln Glu His Leu Gly Leu Ala Glu Thr Arg Ala Glu Gly
         155             160             165

ctg cac cag ctg gag gct gac cac agc cgc atg aag cgt gag gtt agc      761
Leu His Gln Leu Glu Ala Asp His Ser Arg Met Lys Arg Glu Val Ser
170             175             180             185

gca cac ttc cat gag gtg ctg agg ctg aag gac gag atg ctc agc ctc      809
Ala His Phe His Glu Val Leu Arg Leu Lys Asp Glu Met Leu Ser Leu
                190             195             200

tcg ctg cac tat agc aat gcg ctg cag gag aag gag ctg gcc gcc tca      857
Ser Leu His Tyr Ser Asn Ala Leu Gln Glu Lys Glu Leu Ala Ala Ser
                205             210             215

cgc tgc cgc agc ctg cag gag gag ctg tat cta ctg aag cag gag ctg      905
Arg Cys Arg Ser Leu Gln Glu Glu Leu Tyr Leu Leu Lys Gln Glu Leu
         220             225             230

cag cga gcc aac atg gtt tcc tcc tgt gag ctg gaa ttg caa gag cag      953
Gln Arg Ala Asn Met Val Ser Ser Cys Glu Leu Glu Leu Gln Glu Gln
235             240             245

tcc ctg agg aca gcc agc gac cag gag tcc ggg gat gag gag ctg aac     1001
Ser Leu Arg Thr Ala Ser Asp Gln Glu Ser Gly Asp Glu Glu Leu Asn
250             255             260             265

cgc ctg aag gag gag aat gag aaa ctg cgc tcg ctg act ttc agc ctg     1049
Arg Leu Lys Glu Glu Asn Glu Lys Leu Arg Ser Leu Thr Phe Ser Leu
                270             275             280

gcg gag aag gac att ctg gag cag agc ctg gac gag gcg cgg ggg agc     1097
Ala Glu Lys Asp Ile Leu Glu Gln Ser Leu Asp Glu Ala Arg Gly Ser
                285             290             295

cga cag gag ctg gtg gag cgc atc cac tcg ctg cgg gag cgg gcc gtg     1145
Arg Gln Glu Leu Val Glu Arg Ile His Ser Leu Arg Glu Arg Ala Val
         300             305             310

gct gcc gag agg cag cga gag cag tac tgg gaa gag aag gaa cag acc     1193
```

```
Ala Ala Glu Arg Gln Arg Glu Gln Tyr Trp Glu Glu Lys Glu Gln Thr
    315                 320             325

ctg ctg cag ttc cag aag agt aag atg gcc tgc caa ctc tac agg gag    1241
Leu Leu Gln Phe Gln Lys Ser Lys Met Ala Cys Gln Leu Tyr Arg Glu
330                 335             340             345

aag gtg aat gcg ctg cag gcc cag gtg tgc gag ctg cag aag gag cga    1289
Lys Val Asn Ala Leu Gln Ala Gln Val Cys Glu Leu Gln Lys Glu Arg
                350             355             360

gac cag gcg tac tcc gcg agg gac agt gct cag agg gag att tcc cag    1337
Asp Gln Ala Tyr Ser Ala Arg Asp Ser Ala Gln Arg Glu Ile Ser Gln
            365             370             375

agc ctg gtg gag aag gac tcc ctc cgc agg cag gtg ttc gag ctg acg    1385
Ser Leu Val Glu Lys Asp Ser Leu Arg Arg Gln Val Phe Glu Leu Thr
            380             385             390

gac cag gtc tgc gag ctg cgc aca cag ctt cgc cag ctg cag gca gag    1433
Asp Gln Val Cys Glu Leu Arg Thr Gln Leu Arg Gln Leu Gln Ala Glu
            395             400             405

cct ccg ggt gtg ctc aag cag gaa gcc agg acc agg gag ccc tgt cca    1481
Pro Pro Gly Val Leu Lys Gln Glu Ala Arg Thr Arg Glu Pro Cys Pro
410                 415             420             425

cgg gag aag cag cgg ctg gtg cgg atg cat gcc atc tgc ccc aga gac    1529
Arg Glu Lys Gln Arg Leu Val Arg Met His Ala Ile Cys Pro Arg Asp
                430             435             440

gac agc gac tgc agc ctc gtc agc tcc aca gag tct cag ctc ttg tcg    1577
Asp Ser Asp Cys Ser Leu Val Ser Ser Thr Glu Ser Gln Leu Leu Ser
            445             450             455

gac ctg agt gcc acg tcc agc cgc gag ctg gtg gac agc ttc cgc tcc    1625
Asp Leu Ser Ala Thr Ser Ser Arg Glu Leu Val Asp Ser Phe Arg Ser
            460             465             470

agc agc ccc gcg ccc ccc agc cag cag tcc ctg tac aag cgg gtg gcc    1673
Ser Ser Pro Ala Pro Pro Ser Gln Gln Ser Leu Tyr Lys Arg Val Ala
            475             480             485

gag gac ttc ggg gaa gaa ccc tgg tct ttc agc agc tgc ctg gag atc    1721
Glu Asp Phe Gly Glu Glu Pro Trp Ser Phe Ser Ser Cys Leu Glu Ile
490                 495             500             505

ccg gag gga gac ccg gga gcc ctg ccg gga gct aag gca ggc gac cca    1769
Pro Glu Gly Asp Pro Gly Ala Leu Pro Gly Ala Lys Ala Gly Asp Pro
                510             515             520

cac ctg gat tat gag ctc cta gac acg gca gac ctt ccg cag ctg gaa    1817
His Leu Asp Tyr Glu Leu Leu Asp Thr Ala Asp Leu Pro Gln Leu Glu
            525             530             535

agc agc ctg cag cca gtc tcc cct gga agg ctt gat gtc tcg gag agc    1865
Ser Ser Leu Gln Pro Val Ser Pro Gly Arg Leu Asp Val Ser Glu Ser
```

540   545   550

```
ggc gtc ctc atg cgg cgg agg cca gcc cgc agg atc ctg agc cag gtc    1913
Gly Val Leu Met Arg Arg Arg Pro Ala Arg Arg Ile Leu Ser Gln Val
    555             560             565

acc atg ctg gcg ttc cag ggg gat gca ttg ctg gag cag atc agc gtc    1961
Thr Met Leu Ala Phe Gln Gly Asp Ala Leu Leu Glu Gln Ile Ser Val
570             575             580             585

atc ggc ggg aac ctc acg ggc atc ttc atc cac cgg gtc acc ccg ggc    2009
Ile Gly Gly Asn Leu Thr Gly Ile Phe Ile His Arg Val Thr Pro Gly
            590             595             600

tcg gcg gcg gac cag atg gcc ttg cgc ccg ggc acc cag att gtg atg    2057
Ser Ala Ala Asp Gln Met Ala Leu Arg Pro Gly Thr Gln Ile Val Met
            605             610             615

gtt gat tac gaa gcc tca gag ccc ttg ttc aag gca gtc ctg gag gac    2105
Val Asp Tyr Glu Ala Ser Glu Pro Leu Phe Lys Ala Val Leu Glu Asp
            620             625             630

acg acc ctg gag gag gcc gtg ggg ctt ctc agg agg gtg gac ggc ttc    2153
Thr Thr Leu Glu Glu Ala Val Gly Leu Leu Arg Arg Val Asp Gly Phe
    635             640             645

tgc tgc ctg tct gtg aag gtc aac acg gac ggt tat aag agg cta ctc    2201
Cys Cys Leu Ser Val Lys Val Asn Thr Asp Gly Tyr Lys Arg Leu Leu
650             655             660             665

cag gac ctg gag gcc aaa gtg gcg acc tcg ggg gac tca ttc tac atc    2249
Gln Asp Leu Glu Ala Lys Val Ala Thr Ser Gly Asp Ser Phe Tyr Ile
            670             675             680

cgg gtc aac ctg gcc atg gag ggc agg gcc aaa ggg gag ctg cag gtg    2297
Arg Val Asn Leu Ala Met Glu Gly Arg Ala Lys Gly Glu Leu Gln Val
            685             690             695

cat tgc aac gag gtc ctg cac gtc acc gac acc atg ttc cag ggc tgc    2345
His Cys Asn Glu Val Leu His Val Thr Asp Thr Met Phe Gln Gly Cys
    700         .       705             710

ggc tgc tgg cat gcc cac cgc gtg aac tct tac acc atg aag gat act    2393
Gly Cys Trp His Ala His Arg Val Asn Ser Tyr Thr Met Lys Asp Thr
    715             720             725

gcc gcg cac ggc acc atc ccc aac tac tcc agg gct cag cag cag ctc    2441
Ala Ala His Gly Thr Ile Pro Asn Tyr Ser Arg Ala Gln Gln Gln Leu
730             735             740             745

ata gcc ctc atc cag gac atg act cag cag tgc acc gtg acc cgc aag    2489
Ile Ala Leu Ile Gln Asp Met Thr Gln Gln Cys Thr Val Thr Arg Lys
            750             755             760

cca tct tct ggg gga cca cag aag ctg gtc cgc atc gtc agt atg gac    2537
Pro Ser Ser Gly Gly Pro Gln Lys Leu Val Arg Ile Val Ser Met Asp
            765             770             775
```

```
aaa gcc aag gcc agc cct ctg cgt ttg tcc ttt gac agg ggc cag ttg      2585
Lys Ala Lys Ala Ser Pro Leu Arg Leu Ser Phe Asp Arg Gly Gln Leu
        780             785             790

gac ccc agc agg atg gag ggc tcc agc acg tgc ttc tgg gcc gag agc      2633
Asp Pro Ser Arg Met Glu Gly Ser Ser Thr Cys Phe Trp Ala Glu Ser
        795             800             805

tgc ctc acc ctg gtg ccc tat acc ctg gtg tgg ccc cat cga ccc gcc      2681
Cys Leu Thr Leu Val Pro Tyr Thr Leu Val Trp Pro His Arg Pro Ala
810             815             820             825

cgg ccc cgg cct gtg ctc ctc gtg ccc agg gcg gtt ggg aag atc ctg      2729
Arg Pro Arg Pro Val Leu Leu Val Pro Arg Ala Val Gly Lys Ile Leu
            830             835             840

agc gag aaa ctg tgc ctc ctc caa ggg ttt aag aag tgc ctg gca gag      2777
Ser Glu Lys Leu Cys Leu Leu Gln Gly Phe Lys Lys Cys Leu Ala Glu
            845             850             855

tac ttg agc cag gag gag tat gag gcc tgg agc cag aga ggg gac atc      2825
Tyr Leu Ser Gln Glu Glu Tyr Glu Ala Trp Ser Gln Arg Gly Asp Ile
            860             865             870

atc cag gag gga gag gtg tcc ggg ggc cgc tgc tgg gtg acc cgc cat      2873
Ile Gln Glu Gly Glu Val Ser Gly Gly Arg Cys Trp Val Thr Arg His
        875             880             885

gct gtg gag tcc ctc atg gaa aag aac acc cat gcc ctc ctg gac gtc      2921
Ala Val Glu Ser Leu Met Glu Lys Asn Thr His Ala Leu Leu Asp Val
890             895             900             905

cag ctg gac agt gtc tgc acc ctg cac agg atg gac atc ttc ccc atc      2969
Gln Leu Asp Ser Val Cys Thr Leu His Arg Met Asp Ile Phe Pro Ile
            910             915             920

gtc atc cac gtc tct gtc aac gag aag atg gca aag aag ctc aag aag      3017
Val Ile His Val Ser Val Asn Glu Lys Met Ala Lys Lys Leu Lys Lys
            925             930             935

ggc cta cag cgg ttg ggc acc tca gag gag cag ctc ctg gag gct gcg      3065
Gly Leu Gln Arg Leu Gly Thr Ser Glu Glu Gln Leu Leu Glu Ala Ala
            940             945             950

agg cag gag gag gga gac ctg gac cgg gcg ccc tgt cta tac agc agc      3113
Arg Gln Glu Glu Gly Asp Leu Asp Arg Ala Pro Cys Leu Tyr Ser Ser
        955             960             965

ctg gct cct gac ggc tgg agc gac ctg gac ggc ctg ctc agc tgt gtc      3161
Leu Ala Pro Asp Gly Trp Ser Asp Leu Asp Gly Leu Leu Ser Cys Val
970             975             980             985

cgc cag gcc atc gcc gac gag cag aag aag gtg gtg tgg acg gag cag      3209
Arg Gln Ala Ile Ala Asp Glu Gln Lys Lys Val Val Trp Thr Glu Gln
            990             995             1000
```

```
agc ccc cga tgatgcaccg tgccccttcc cgggactgtg ggggcttctg          3258
Ser Pro Arg


tgtgcctgtt aatgcagtcc tgttcctcag cccaggccct cttggcacag ctgtgggctc   3318
cttggcacat gaggccggct ctccccactg gctgggggtct aaccttgaac cctcaccacg   3378
tgcaggtcac acacagtgaa gccacttgta actgcacact tttctgtgga aacatcttca   3438
ccctttacca ggcttggcat ggtctgaact ggaaaccctg agaatgtttc tgcagtagga   3498
caggagggac atcttcccat gccttcccta gaaccggagg ccccggactt ctctggaaaa   3558
ccgcctgtct gcaggcccga ttcaaatcta tggggggctgc acttcccttt tacattttga   3618
tgtgtcaaag gcttttggag tgaccaaaag cacagaggca gcgggtgggg cgcctgggtg   3678
gtccccaagg tcgctgccac ccttgcccgg ggcagaggca taagcccaca tatgctgtga   3738
cgctggccac cttttctcag cttctgaggc tgcgatgcct caggaactcc agtttacaga   3798
gaccagtgtg tttacttgta aataaagcct ctgggtggtg gagacggtac tttcagtggg   3858
tctgtgcccc gtggcccctg tgcctgttcg gtgggggtgt cccagagaag cctggcacca   3918
gtaccccgt caa                                                         3931


<210> 2
<211> 1004
<212> PRT
<213> Homo sapiens

<400> 2
Met Gly Glu Leu Cys Arg Arg Asp Ser Ala Leu Thr Ala Leu Asp Glu
1               5                   10                  15
Glu Thr Leu Trp Glu Met Met Glu Ser His Arg His Arg Ile Val Arg
            20                  25                  30
Cys Ile Cys Pro Ser Arg Leu Thr Pro Tyr Leu Arg Gln Ala Lys Val
        35                  40                  45
Leu Cys Gln Leu Asp Glu Glu Glu Val Leu His Ser Pro Arg Leu Thr
    50                  55                  60
Asn Ser Ala Met Arg Ala Gly His Leu Leu Asp Leu Leu Lys Thr Arg
65                  70                  75                  80
Gly Lys Asn Gly Ala Ile Ala Phe Leu Glu Ser Leu Lys Phe His Asn
                85                  90                  95
Pro Asp Val Tyr Thr Leu Val Thr Gly Leu Gln Pro Asp Val Asp Phe
            100                 105                 110
Ser Asn Phe Ser Gly Leu Met Glu Thr Ser Lys Leu Thr Glu Cys Leu
        115                 120                 125
Ala Gly Ala Ile Gly Ser Leu Gln Glu Glu Leu Asn Gln Glu Lys Gly
    130                 135                 140
Gln Lys Glu Val Leu Leu Arg Arg Cys Gln Gln Leu Gln Glu His Leu
145                 150                 155                 160
Gly Leu Ala Glu Thr Arg Ala Glu Gly Leu His Gln Leu Glu Ala Asp
                165                 170                 175
His Ser Arg Met Lys Arg Glu Val Ser Ala His Phe His Glu Val Leu
            180                 185                 190
Arg Leu Lys Asp Glu Met Leu Ser Leu Ser Leu His Tyr Ser Asn Ala
        195                 200                 205
Leu Gln Glu Lys Glu Leu Ala Ala Ser Arg Cys Arg Ser Leu Gln Glu
    210                 215                 220
Glu Leu Tyr Leu Leu Lys Gln Glu Leu Gln Arg Ala Asn Met Val Ser
225                 230                 235                 240
Ser Cys Glu Leu Glu Leu Gln Glu Gln Ser Leu Arg Thr Ala Ser Asp
                245                 250                 255
Gln Glu Ser Gly Asp Glu Glu Leu Asn Arg Leu Lys Glu Glu Asn Glu
            260                 265                 270
```

```
Lys Leu Arg Ser Leu Thr Phe Ser Leu Ala Glu Lys Asp Ile Leu Glu
        275                 280                 285
Gln Ser Leu Asp Glu Ala Arg Gly Ser Arg Gln Glu Leu Val Glu Arg
        290                 295                 300
Ile His Ser Leu Arg Glu Arg Ala Val Ala Ala Glu Arg Gln Arg Glu
305                 310                 315                 320
Gln Tyr Trp Glu Glu Lys Glu Gln Thr Leu Leu Gln Phe Gln Lys Ser
            325                 330                 335
Lys Met Ala Cys Gln Leu Tyr Arg Glu Lys Val Asn Ala Leu Gln Ala
            340                 345                 350
Gln Val Cys Glu Leu Gln Lys Glu Arg Asp Gln Ala Tyr Ser Ala Arg
        355                 360                 365
Asp Ser Ala Gln Arg Glu Ile Ser Gln Ser Leu Val Glu Lys Asp Ser
370                 375                 380
Leu Arg Arg Gln Val Phe Glu Leu Thr Asp Gln Val Cys Glu Leu Arg
385                 390                 395                 400
Thr Gln Leu Arg Gln Leu Gln Ala Glu Pro Pro Gly Val Leu Lys Gln
            405                 410                 415
Glu Ala Arg Thr Arg Glu Pro Cys Pro Arg Glu Lys Gln Arg Leu Val
            420                 425                 430
Arg Met His Ala Ile Cys Pro Arg Asp Asp Ser Asp Cys Ser Leu Val
            435                 440                 445
Ser Ser Thr Glu Ser Gln Leu Leu Ser Asp Leu Ser Ala Thr Ser Ser
        450                 455                 460
Arg Glu Leu Val Asp Ser Phe Arg Ser Ser Ser Pro Ala Pro Pro Ser
465                 470                 475                 480
Gln Gln Ser Leu Tyr Lys Arg Val Ala Glu Asp Phe Gly Glu Glu Pro
            485                 490                 495
Trp Ser Phe Ser Ser Cys Leu Glu Ile Pro Glu Gly Asp Pro Gly Ala
            500                 505                 510
Leu Pro Gly Ala Lys Ala Gly Asp Pro His Leu Asp Tyr Glu Leu Leu
            515                 520                 525
Asp Thr Ala Asp Leu Pro Gln Leu Glu Ser Ser Leu Gln Pro Val Ser
        530                 535                 540
Pro Gly Arg Leu Asp Val Ser Glu Ser Gly Val Leu Met Arg Arg Arg
545                 550                 555                 560
Pro Ala Arg Arg Ile Leu Ser Gln Val Thr Met Leu Ala Phe Gln Gly
            565                 570                 575
Asp Ala Leu Leu Glu Gln Ile Ser Val Ile Gly Gly Asn Leu Thr Gly
            580                 585                 590
Ile Phe Ile His Arg Val Thr Pro Gly Ser Ala Ala Asp Gln Met Ala
            595                 600                 605
Leu Arg Pro Gly Thr Gln Ile Val Met Val Asp Tyr Glu Ala Ser Glu
        610                 615                 620
Pro Leu Phe Lys Ala Val Leu Glu Asp Thr Thr Leu Glu Glu Ala Val
625                 630                 635                 640
Gly Leu Leu Arg Arg Val Asp Gly Phe Cys Cys Leu Ser Val Lys Val
            645                 650                 655
Asn Thr Asp Gly Tyr Lys Arg Leu Leu Gln Asp Leu Glu Ala Lys Val
            660                 665                 670
Ala Thr Ser Gly Asp Ser Phe Tyr Ile Arg Val Asn Leu Ala Met Glu
        675                 680                 685
Gly Arg Ala Lys Gly Glu Leu Gln Val His Cys Asn Glu Val Leu His
        690                 695                 700
Val Thr Asp Thr Met Phe Gln Gly Cys Gly Cys Trp His Ala His Arg
705                 710                 715                 720
Val Asn Ser Tyr Thr Met Lys Asp Thr Ala Ala His Gly Thr Ile Pro
```

```
                     725                    730                    735
Asn Tyr Ser Arg Ala Gln Gln Gln Leu Ile Ala Leu Ile Gln Asp Met
             740                    745                    750
Thr Gln Gln Cys Thr Val Thr Arg Lys Pro Ser Ser Gly Gly Pro Gln
             755                    760                    765
Lys Leu Val Arg Ile Val Ser Met Asp Lys Ala Lys Ala Ser Pro Leu
         770                    775                    780
Arg Leu Ser Phe Asp Arg Gly Gln Leu Asp Pro Ser Arg Met Glu Gly
785                    790                    795                    800
Ser Ser Thr Cys Phe Trp Ala Glu Ser Cys Leu Thr Leu Val Pro Tyr
             805                    810                    815
Thr Leu Val Trp Pro His Arg Pro Ala Arg Pro Arg Pro Val Leu Leu
             820                    825                    830
Val Pro Arg Ala Val Gly Lys Ile Leu Ser Glu Lys Leu Cys Leu Leu
         835                    840                    845
Gln Gly Phe Lys Lys Cys Leu Ala Glu Tyr Leu Ser Gln Glu Glu Tyr
         850                    855                    860
Glu Ala Trp Ser Gln Arg Gly Asp Ile Ile Gln Glu Gly Glu Val Ser
865                    870                    875                    880
Gly Gly Arg Cys Trp Val Thr Arg His Ala Val Glu Ser Leu Met Glu
             885                    890                    895
Lys Asn Thr His Ala Leu Leu Asp Val Gln Leu Asp Ser Val Cys Thr
             900                    905                    910
Leu His Arg Met Asp Ile Phe Pro Ile Val Ile His Val Ser Val Asn
             915                    920                    925
Glu Lys Met Ala Lys Lys Leu Lys Lys Gly Leu Gln Arg Leu Gly Thr
         930                    935                    940
Ser Glu Glu Gln Leu Leu Glu Ala Ala Arg Gln Glu Glu Gly Asp Leu
945                    950                    955                    960
Asp Arg Ala Pro Cys Leu Tyr Ser Ser Leu Ala Pro Asp Gly Trp Ser
             965                    970                    975
Asp Leu Asp Gly Leu Leu Ser Cys Val Arg Gln Ala Ile Ala Asp Glu
             980                    985                    990
Gln Lys Lys Val Val Trp Thr Glu Gln Ser Pro Arg
         995                    1000
```

<210> 3
<211> 3012
<212> DNA
<213> Homo sapiens

<400> 3
```
atggggaac tgtgccgcag ggactccgca ctcacggcac tggacgagga gacactgtgg    60
gagatgatgg agagccaccg ccacaggatc gtacgctgca tctgccccag ccgcctcacc   120
ccctacctgc gccaggccaa ggtgctgtgc cagctggacg aggaggaggt gctgcacagc   180
ccccggctca ccaacagcgc catgcgggcc gggcacttgc tggatttgct gaagactcga   240
gggaagaacg gggccatcgc cttcctggag agcctgaagt tccacaaccc tgacgtctac   300
accctggtca ccgggctgca gcctgatgtt gacttcagta actttagcgg tctcatggag   360
acatccaagc tgaccgagtg cctggctggg gccatcggca gcctgcagga ggagctgaac   420
caggaaaagg ggcagaagga ggtgctgctg cggcggtgcc agcagctgca ggagcacctg   480
ggcctggccg agacccgtgc cgagggcctg caccagctgg aggctgacca cagccgcatg   540
aagcgtgagg ttagcgcaca cttccatgag gtgctgaggc tgaaggacga gatgctcagc   600
ctctcgctgc actatagcaa tgcgctgcag agaaggagc tggccgcctc acgctgccgc   660
agcctgcagg aggagctgta tctactgaag caggagctgc agcgagccaa catggtttcc   720
tcctgtgagc tggaattgca agagcagtcc ctgaggacag ccagcgacca ggagtccggg   780
gatgaggagc tgaaccgcct gaaggaggag aatgagaaac tgcgctcgct gactttcagc   840
ctggcggaga aggacattct ggagcagagc ctggacgagg cgcgggggag ccgacaggag   900
```

```
ctggtggagc gcatccactc gctgcgggag cgggccgtgg ctgccgagag gcagcgagag    960
cagtactggg aagagaagga acagaccctg ctgcagttcc agaagagtaa gatggcctgc   1020
caactctaca gggagaaggt gaatgcgctg caggcccagg tgtgcgagct gcagaaggag   1080
cgagaccagg cgtactccgc gagggacagt gctcagaggg agatttccca gagcctggtg   1140
gagaaggact ccctccgcag gcaggtgttc gagctgacgg accaggtctg cgagctgcgc   1200
acacagcttc gccagctgca ggcagagcct ccgggtgtgc tcaagcagga agccaggacc   1260
agggagccct gtccacggga gaagcagcgg ctggtgcgga tgcatgccat ctgccccaga   1320
gacgacagcg actgcagcct cgtcagctcc acagagtctc agctcttgtc ggacctgagt   1380
gccacgtcca gccgcgagct ggtggacagc ttccgctcca gcagccccgc gcccccagc    1440
cagcagtccc tgtacaagcg ggtggccgag gacttcgggg aagaaccctg gtctttcagc   1500
agctgcctgg agatcccgga gggagacccg ggagccctgc cgggagctaa ggcaggcgac   1560
ccacacctgg attatgagct cctagacacg gcagaccttc gcagctgga aagcagcctg    1620
cagccagtct cccctggaag gcttgatgtc tcggagagcg gcgtcctcat gcggcggagg   1680
ccagcccgca ggatcctgag ccaggtcacc atgctggcgt tccagggga tgcattgctg    1740
gagcagatca gcgtcatcgg cgggaacctc acgggcatct tcatccaccg ggtcaccccg   1800
ggctcggcgg cggaccagat ggccttgcgc ccgggcaccc agattgtgat ggttgattac   1860
gaagcctcag agcccttgtt caaggcagtc ctggaggaca cgaccctgga ggaggccgtg   1920
gggcttctca ggagggtgga cggcttctgc tgcctgtctg tgaaggtcaa cacggacggt   1980
tataagaggc tactccagga cctggaggcc aaagtggcga cctcggggga ctcattctac   2040
atccgggtca acctggccat ggagggcagg gccaagggg agctgcaggt gcattgcaac    2100
gaggtcctgc acgtcaccga caccatgttc cagggctgcg ctgctggca tgcccaccgc    2160
gtgaactctt acaccatgaa ggatactgcc gcgcacggca ccatccccaa ctactccagg   2220
gctcagcagc agctcatagc cctcatccag gacatgactc agcagtgcac cgtgacccgc   2280
aagccatctt ctggggggacc acagaagctg gtccgcatcg tcagtatgga caaagccaag   2340
gccagccctc tgcgtttgtc ctttgacagg ggccagttgg accccagcag gatggagggc   2400
tccagcacgt gcttctgggc cgagagctgc ctcaccctgg tgccctatac cctggtgtgg   2460
ccccatcgac cgcccggcc ccggcctgtg ctcctcgtgc caggggcggt tgggaagatc   2520
ctgagcgaga aactgtgcct cctccaaggg tttaagaagt gcctggcaga gtacttgagc   2580
caggaggagt atgaggcctg gagccagaga ggggacatca tccaggaggg agaggtgtcc   2640
gggggccgct gctgggtgac ccgccatgct gtggagtccc tcatggaaaa gaacacccat   2700
gccctcctgg acgtccagct ggacagtgtc tgcaccctgc acaggatgga catcttcccc   2760
atcgtcatcc acgtctctgt caacgagaag atggcaaaga agctcaagaa gggcctacag   2820
cggttgggca cctcagagga gcagctcctg gaggctgcga ggcaggagga gggagacctg   2880
gaccgggcgc cctgtctata cagcagcctg gctcctgacg ctggagcga cctggacggc    2940
ctgctcagct gtgtccgcca ggccatcgcc gacgagcaga agaaggtggt gtggacggag   3000
cagagccccc ga                                                        3012
```

```
<210> 4
<211> 3417
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (1)...(3417)

<400> 4
atg ggg gaa ctg tgc cgc agg gac tcc gca ctc acg gca ctg gac gag      48
Met Gly Glu Leu Cys Arg Arg Asp Ser Ala Leu Thr Ala Leu Asp Glu
1               5                   10                  15

gag aca ctg tgg gag atg atg gag agc cac cgc cac agg atc gta cgc      96
Glu Thr Leu Trp Glu Met Met Glu Ser His Arg His Arg Ile Val Arg
                20                  25                  30

tgc atc tgc ccc agc cgc ctc acc ccc tac ctg cgc cag gcc aag gtg     144
Cys Ile Cys Pro Ser Arg Leu Thr Pro Tyr Leu Arg Gln Ala Lys Val
```

35	40	45	

```
            ctg tgc cag ctg gac gag gag gag gtg ctg cac agc ccc cgg ctc acc       192
            Leu Cys Gln Leu Asp Glu Glu Glu Val Leu His Ser Pro Arg Leu Thr
                50              55              60

            aac agc gcc atg cgg gcc ggg cac ttg ctg gat ttg ctg aag act cga       240
            Asn Ser Ala Met Arg Ala Gly His Leu Leu Asp Leu Leu Lys Thr Arg
            65              70              75              80

            ggg aag aac ggg gcc atc gcc ttc ctg gag agc ctg aag ttc cac aac       288
            Gly Lys Asn Gly Ala Ile Ala Phe Leu Glu Ser Leu Lys Phe His Asn
                        85              90              95

            cct gac gtc tac acc ctg gtc acc ggg ctg cag cct gat gtt gac ttc       336
            Pro Asp Val Tyr Thr Leu Val Thr Gly Leu Gln Pro Asp Val Asp Phe
                        100             105             110

            agt aac ttt agc ggt gag agc tcc gac ttt gac ggt ttg gca ggc act       384
            Ser Asn Phe Ser Gly Glu Ser Ser Asp Phe Asp Gly Leu Ala Gly Thr
                        115             120             125

            tct agg aac ctc agg ctc ctg gta acc cca ggt ctc atg gag aca tcc       432
            Ser Arg Asn Leu Arg Leu Leu Val Thr Pro Gly Leu Met Glu Thr Ser
                130             135             140

            aag ctg acc gag tgc ctg gct ggg gcc atc ggc agc ctg cag gag gag       480
            Lys Leu Thr Glu Cys Leu Ala Gly Ala Ile Gly Ser Leu Gln Glu Glu
            145             150             155             160

            ctg aac cag gaa aag ggg cag aag gag gtg ctg ctg cgg cgg tgc cag       528
            Leu Asn Gln Glu Lys Gly Gln Lys Glu Val Leu Leu Arg Arg Cys Gln
                        165             170             175

            cag ctg cag gag cac ctg ggc ctg gcc gag acc cgt gcc gag ggc ctg       576
            Gln Leu Gln Glu His Leu Gly Leu Ala Glu Thr Arg Ala Glu Gly Leu
                        180             185             190

            cac cag ctg gag gct gac cac agc cgc atg aag cgt gag gtt agc gca       624
            His Gln Leu Glu Ala Asp His Ser Arg Met Lys Arg Glu Val Ser Ala
                        195             200             205

            cac ttc cat gag gtg ctg agg ctg aag gac gag atg ctc agc ctc tcg       672
            His Phe His Glu Val Leu Arg Leu Lys Asp Glu Met Leu Ser Leu Ser
                210             215             220

            ctg cac tat agc aat gcg ctg cag gag aag gag ctg gcc gcc tca cgc       720
            Leu His Tyr Ser Asn Ala Leu Gln Glu Lys Glu Leu Ala Ala Ser Arg
            225             230             235             240

            tgc cgc agc ctg cag gag gag ctg tat cta ctg aag cag gag ctg cag       768
            Cys Arg Ser Leu Gln Glu Glu Leu Tyr Leu Leu Lys Gln Glu Leu Gln
                        245             250             255

            cga gcc aac atg gtt tcc tcc tgt gag ctg gaa ttg caa gag cag tcc       816
            Arg Ala Asn Met Val Ser Ser Cys Glu Leu Glu Leu Gln Glu Gln Ser
                        260             265             270
```

```
ctg agg aca gcc agc gac cag gag tcc ggg gat gag gag ctg aac cgc    864
Leu Arg Thr Ala Ser Asp Gln Glu Ser Gly Asp Glu Glu Leu Asn Arg
        275             280                 285

ctg aag gag gag aat gag aaa ctg cgc tcg ctg act ttc agc ctg gcg    912
Leu Lys Glu Glu Asn Glu Lys Leu Arg Ser Leu Thr Phe Ser Leu Ala
        290             295                 300

gag aag gac att ctg gag cag agc ctg gac gag gcg cgg ggg agc cga    960
Glu Lys Asp Ile Leu Glu Gln Ser Leu Asp Glu Ala Arg Gly Ser Arg
305             310                 315                 320

cag gag ctg gtg gag cgc atc cac tcg ctg cgg gag cgg gcc gtg gct    1008
Gln Glu Leu Val Glu Arg Ile His Ser Leu Arg Glu Arg Ala Val Ala
            325                 330                 335

gcc gag agg cag cga gag cag gcc aga ccc tca gag ctg ctg agc ttc    1056
Ala Glu Arg Gln Arg Glu Gln Ala Arg Pro Ser Glu Leu Leu Ser Phe
            340                 345                 350

acg gtc cat gtg tcc cac tct gtc cag tac tgg gaa gag aag gaa cag    1104
Thr Val His Val Ser His Ser Val Gln Tyr Trp Glu Glu Lys Glu Gln
            355                 360                 365

acc ctg ctg cag ttc cag aag agt aag atg gcc tgc caa ctc tac agg    1152
Thr Leu Leu Gln Phe Gln Lys Ser Lys Met Ala Cys Gln Leu Tyr Arg
        370             375                 380

gag aag gtg aat gcg ctg cag gcc cag gtg tgc gag ctg cag aag gag    1200
Glu Lys Val Asn Ala Leu Gln Ala Gln Val Cys Glu Leu Gln Lys Glu
385             390                 395                 400

cga gac cag gcg tac tcc gcg agg gac agt gct cag agg gag att tcc    1248
Arg Asp Gln Ala Tyr Ser Ala Arg Asp Ser Ala Gln Arg Glu Ile Ser
                405                 410                 415

cag agc ctg gtg gag aag gac tcc ctc cgc agg cag gtg ttc gag ctg    1296
Gln Ser Leu Val Glu Lys Asp Ser Leu Arg Arg Gln Val Phe Glu Leu
            420                 425                 430

acg gac cag gtc tgc gag ctg cgc aca cag ctt cgc cag ctg cag gca    1344
Thr Asp Gln Val Cys Glu Leu Arg Thr Gln Leu Arg Gln Leu Gln Ala
            435                 440                 445

gag cct ccg ggt gtg ctc aag cag gaa gcc agg acc agg gag ccc tgt    1392
Glu Pro Pro Gly Val Leu Lys Gln Glu Ala Arg Thr Arg Glu Pro Cys
        450             455                 460

cca cgg gag aag cag cgg ctg gtg cgg atg cat gcc atc tgc ccc aga    1440
Pro Arg Glu Lys Gln Arg Leu Val Arg Met His Ala Ile Cys Pro Arg
465             470                 475                 480

gac gac agc gac tgc agc ctc gtc agc tcc aca gag tct cag ctc ttg    1488
Asp Asp Ser Asp Cys Ser Leu Val Ser Ser Thr Glu Ser Gln Leu Leu
            485                 490                 495
```

```
tcg gac ctg agt gcc acg tcc agc cgc gag ctg gtg gac agc ttc cgc       1536
Ser Asp Leu Ser Ala Thr Ser Ser Arg Glu Leu Val Asp Ser Phe Arg
            500             505             510

tcc agc agc ccc gcg ccc ccc agc cag cag tcc ctg tac aag cgg gtg       1584
Ser Ser Ser Pro Ala Pro Pro Ser Gln Gln Ser Leu Tyr Lys Arg Val
            515             520             525

gcc gag gac ttc ggg gaa gaa ccc tgg tct ttc agc agc tgc ctg gag       1632
Ala Glu Asp Phe Gly Glu Glu Pro Trp Ser Phe Ser Ser Cys Leu Glu
        530             535             540

atc ccg gag gga gac ccg gga gcc ctg ccg gga gct aag gca ggc gac       1680
Ile Pro Glu Gly Asp Pro Gly Ala Leu Pro Gly Ala Lys Ala Gly Asp
545             550             555             560

cca cac ctg gat tat gag ctc cta gac acg gca gac ctt ccg cag ctg       1728
Pro His Leu Asp Tyr Glu Leu Leu Asp Thr Ala Asp Leu Pro Gln Leu
                565             570             575

gaa agc agc ctg cag cca gtc tcc cct gga agg ctt gat gtc tcg gag       1776
Glu Ser Ser Leu Gln Pro Val Ser Pro Gly Arg Leu Asp Val Ser Glu
            580             585             590

agt gca caa gcc ggt cgt ctc ccg gcc tgc agc ggc gtc ctc atg cgg       1824
Ser Ala Gln Ala Gly Arg Leu Pro Ala Cys Ser Gly Val Leu Met Arg
            595             600             605

cgg agg cca gcc cgc agg atc ctg agc cag gtc acc atg ctg gcg ttc       1872
Arg Arg Pro Ala Arg Arg Ile Leu Ser Gln Val Thr Met Leu Ala Phe
        610             615             620

cag ggg gat gca ttg ctg gag cag atc agc gtc atc ggc ggg aac ctc       1920
Gln Gly Asp Ala Leu Leu Glu Gln Ile Ser Val Ile Gly Gly Asn Leu
625             630             635             640

acg ggc atc ttc atc cac cgg gtc acc ccg ggc tcg gcg gcg gac cag       1968
Thr Gly Ile Phe Ile His Arg Val Thr Pro Gly Ser Ala Ala Asp Gln
                645             650             655

atg gcc ttg cgc ccg ggc acc cag att gtg atg gtt gat tac gaa gcc       2016
Met Ala Leu Arg Pro Gly Thr Gln Ile Val Met Val Asp Tyr Glu Ala
            660             665             670

tca gag ccc ttg ttc aag gca gtc ctg gag gac acg acc ctg gag gag       2064
Ser Glu Pro Leu Phe Lys Ala Val Leu Glu Asp Thr Thr Leu Glu Glu
            675             680             685

gcc gtg ggg ctt ctc agg agg gtg gac ggc ttc tgc tgc ctg tct gtg       2112
Ala Val Gly Leu Leu Arg Arg Val Asp Gly Phe Cys Cys Leu Ser Val
            690             695             700

aag gtc aac acg gac ggt tat aag agg cta ctc cag gac ctg gag gcc       2160
Lys Val Asn Thr Asp Gly Tyr Lys Arg Leu Leu Gln Asp Leu Glu Ala
705             710             715             720

aaa gtg gcg acc tcg ggg gac tca ttc tac atc cgg gtc aac ctg gcc       2208
```

```
      Lys Val Ala Thr Ser Gly Asp Ser Phe Tyr Ile Arg Val Asn Leu Ala
                      725             730                 735

      atg gag ggc agg gcc aaa ggg gag ctg cag gtg cat tgc aac gag gtc   2256
      Met Glu Gly Arg Ala Lys Gly Glu Leu Gln Val His Cys Asn Glu Val
                  740             745                 750

      ctg cac gtc acc gac acc atg ttc cag ggc tgc ggc tgc tgg cat gcc   2304
      Leu His Val Thr Asp Thr Met Phe Gln Gly Cys Gly Cys Trp His Ala
                  755             760                 765

      cac cgc gtg aac tct tac acc atg aag gat act gcc gcg cac ggc acc   2352
      His Arg Val Asn Ser Tyr Thr Met Lys Asp Thr Ala Ala His Gly Thr
              770             775             780

      atc ccc aac tac tcc agg gct cag cag cag ctc ata gcc ctc atc cag   2400
      Ile Pro Asn Tyr Ser Arg Ala Gln Gln Gln Leu Ile Ala Leu Ile Gln
      785             790             795                 800

      gac atg act cag cag tgc acc gtg acc cgc aag cca tct tct ggg gga   2448
      Asp Met Thr Gln Gln Cys Thr Val Thr Arg Lys Pro Ser Ser Gly Gly
                  805             810             815

      cca cag aag ctg gtc cgc atc gtc agt atg gac aaa gcc aag gcc agc   2496
      Pro Gln Lys Leu Val Arg Ile Val Ser Met Asp Lys Ala Lys Ala Ser
                  820             825             830

      cct ctg cgt ttg tcc ttt gac agg ggc cag ttg gac ccc agc agg atg   2544
      Pro Leu Arg Leu Ser Phe Asp Arg Gly Gln Leu Asp Pro Ser Arg Met
                  835             840             845

      gag ggc tcc agc acg tgc ttc tgg gcc gag agc tgc ctc acc ctg gtg   2592
      Glu Gly Ser Ser Thr Cys Phe Trp Ala Glu Ser Cys Leu Thr Leu Val
                  850             855             860

      ccc tat acc ctg gtg cgg ccc cat cga ccc gcc cgg ccc cgg cct gtg   2640
      Pro Tyr Thr Leu Val Arg Pro His Arg Pro Ala Arg Pro Arg Pro Val
      865             870             875                 880

      ctc ctc gtg ccc agg gcg gtt ggg aag atc ctg agc gag aaa ctg tgc   2688
      Leu Leu Val Pro Arg Ala Val Gly Lys Ile Leu Ser Glu Lys Leu Cys
                  885             890             895

      ctc ctc caa ggg ttt aag aag tgc ctg gca gag tac ttg agc cag gag   2736
      Leu Leu Gln Gly Phe Lys Lys Cys Leu Ala Glu Tyr Leu Ser Gln Glu
                  900             905             910

      gag tat gag gcc tgg agc cag aga ggg gac atc atc cag gag gga gag   2784
      Glu Tyr Glu Ala Trp Ser Gln Arg Gly Asp Ile Ile Gln Glu Gly Glu
                  915             920             925

      gtg tcc ggg ggc cgc tgc tgg gtg acc cgc cat gct gtg gag tcc ctc   2832
      Val Ser Gly Gly Arg Cys Trp Val Thr Arg His Ala Val Glu Ser Leu
                  930             935             940

      atg gaa aag aac acc cat gcc ctc ctg gac gtc cag ctg gac agt gtc   2880
      Met Glu Lys Asn Thr His Ala Leu Leu Asp Val Gln Leu Asp Ser Val
```

945　　　　　　　　　　950　　　　　　　　　955　　　　　　　　　960

```
tgc acc ctg cac agg atg gac atc ttc ccc atc gtc atc cac gtc tct        2928
Cys Thr Leu His Arg Met Asp Ile Phe Pro Ile Val Ile His Val Ser
            965                 970                 975

gtc aac gag aag atg gca aag aag ctc aag aag ggc cta cag cgg ttg        2976
Val Asn Glu Lys Met Ala Lys Lys Leu Lys Lys Gly Leu Gln Arg Leu
            980                 985                 990

ggc acc tca gag gag cag ctc ctg gag gct gcg agg cag gag gag gga        3024
Gly Thr Ser Glu Glu Gln Leu Leu Glu Ala Ala Arg Gln Glu Glu Gly
        995                 1000                1005

gac ctg gac cgg gcg ccc tgt cta tac agc agc ctg gct cct gac ggc        3072
Asp Leu Asp Arg Ala Pro Cys Leu Tyr Ser Ser Leu Ala Pro Asp Gly
    1010                1015                1020

tgg agc gac ctg gac ggc ctg ctc agc tgt gtc cgc cag gcc atc gcc        3120
Trp Ser Asp Leu Asp Gly Leu Leu Ser Cys Val Arg Gln Ala Ile Ala
1025                1030                1035                1040

gac gag cag aag aag gtg caa cgc cga cgt cat cca aga att aac cca        3168
Asp Glu Gln Lys Lys Val Gln Arg Arg Arg His Pro Arg Ile Asn Pro
                1045                1050                1055

agc cag agg acg ggc atc gcc acc cag caa cgc cag tgt cac cga aga        3216
Ser Gln Arg Thr Gly Ile Ala Thr Gln Gln Arg Gln Cys His Arg Arg
                1060                1065                1070

att aac cca agg cag agg atg ggc att gcc acc cag caa cgc cag tgt        3264
Ile Asn Pro Arg Gln Arg Met Gly Ile Ala Thr Gln Gln Arg Gln Cys
                1075                1080                1085

cac cga aga att aac cca agc cag agg acg ggc atc acc acc cag caa        3312
His Arg Arg Ile Asn Pro Ser Gln Arg Thr Gly Ile Thr Thr Gln Gln
        1090                1095                1100

tgc cag tgt cac cga aga att aac cca agc cag agg acg ggc atc gcc        3360
Cys Gln Cys His Arg Arg Ile Asn Pro Ser Gln Arg Thr Gly Ile Ala
1105                1110                1115                1120

atg cct tca tct tcg gac act ctc aaa aaa gat aag ctt ctg ccc aga        3408
Met Pro Ser Ser Ser Asp Thr Leu Lys Lys Asp Lys Leu Leu Pro Arg
                1125                1130                1135

aac acc aca                                                            3417
Asn Thr Thr
```

<210> 5
<211> 1138
<212> PRT
<213> Homo sapiens

<400> 5
```
Gly Glu Leu Cys Arg Arg Asp Ser Ala Leu Thr Ala Leu Asp Glu Glu
1               5                   10                  15
```

```
Thr Leu Trp Glu Met Met Glu Ser His Arg His Arg Ile Val Arg Cys
        20                  25                  30
Ile Cys Pro Ser Arg Leu Thr Pro Tyr Leu Arg Gln Ala Lys Val Leu
        35                  40                  45
Cys Gln Leu Asp Glu Glu Glu Val Leu His Ser Pro Arg Leu Thr Asn
    50                  55                  60
Ser Ala Met Arg Ala Gly His Leu Leu Asp Leu Leu Lys Thr Arg Gly
65                  70                  75                  80
Lys Asn Gly Ala Ile Ala Phe Leu Glu Ser Leu Lys Phe His Asn Pro
                85                  90                  95
Asp Val Tyr Thr Leu Val Thr Gly Leu Gln Pro Asp Val Asp Phe Ser
            100                 105                 110
Asn Phe Ser Gly Glu Ser Ser Asp Phe Asp Gly Leu Ala Gly Thr Ser
        115                 120                 125
Arg Asn Leu Arg Leu Leu Val Thr Pro Gly Leu Met Glu Thr Ser Lys
    130                 135                 140
Leu Thr Glu Cys Leu Ala Gly Ala Ile Gly Ser Leu Gln Glu Glu Leu
145                 150                 155                 160
Asn Gln Glu Lys Gly Gln Lys Glu Val Leu Leu Arg Arg Cys Gln Gln
                165                 170                 175
Leu Gln Glu His Leu Gly Leu Ala Glu Thr Arg Ala Glu Gly Leu His
            180                 185                 190
Gln Leu Glu Ala Asp His Ser Arg Met Lys Arg Glu Val Ser Ala His
        195                 200                 205
Phe His Glu Val Leu Arg Leu Lys Asp Glu Met Leu Ser Leu Ser Leu
    210                 215                 220
His Tyr Ser Asn Ala Leu Gln Glu Lys Glu Leu Ala Ala Ser Arg Cys
225                 230                 235                 240
Arg Ser Leu Gln Glu Glu Leu Tyr Leu Leu Lys Gln Glu Leu Gln Arg
            245                 250                 255
Ala Asn Met Val Ser Ser Cys Glu Leu Glu Leu Gln Glu Gln Ser Leu
            260                 265                 270
Arg Thr Ala Ser Asp Gln Glu Ser Gly Asp Glu Glu Leu Asn Arg Leu
            275                 280                 285
Lys Glu Glu Asn Glu Lys Leu Arg Ser Leu Thr Phe Ser Leu Ala Glu
    290                 295                 300
Lys Asp Ile Leu Glu Gln Ser Leu Asp Glu Ala Arg Gly Ser Arg Gln
305                 310                 315                 320
Glu Leu Val Glu Arg Ile His Ser Leu Arg Glu Arg Ala Val Ala Ala
            325                 330                 335
Glu Arg Gln Arg Glu Gln Ala Arg Pro Ser Glu Leu Leu Ser Phe Thr
            340                 345                 350
Val His Val Ser His Ser Val Gln Tyr Trp Glu Glu Lys Glu Gln Thr
            355                 360                 365
Leu Leu Gln Phe Gln Lys Ser Lys Met Ala Cys Gln Leu Tyr Arg Glu
    370                 375                 380
Lys Val Asn Ala Leu Gln Ala Gln Val Cys Glu Leu Gln Lys Glu Arg
385                 390                 395                 400
Asp Gln Ala Tyr Ser Ala Arg Asp Ser Ala Gln Arg Glu Ile Ser Gln
            405                 410                 415
Ser Leu Val Glu Lys Asp Ser Leu Arg Arg Gln Val Phe Glu Leu Thr
            420                 425                 430
Asp Gln Val Cys Glu Leu Arg Thr Gln Leu Arg Gln Leu Gln Ala Glu
        435                 440                 445
Pro Pro Gly Val Leu Lys Gln Glu Ala Arg Thr Arg Glu Pro Cys Pro
    450                 455                 460
Arg Glu Lys Gln Arg Leu Val Arg Met His Ala Ile Cys Pro Arg Asp
```

```
     465                    470                    475                    480
Asp Ser Asp Cys Ser Leu Val Ser Ser Thr Glu Ser Gln Leu Leu Ser
              485                    490                    495
Asp Leu Ser Ala Thr Ser Ser Arg Glu Leu Val Asp Ser Phe Arg Ser
              500                    505                    510
Ser Ser Pro Ala Pro Pro Ser Gln Gln Ser Leu Tyr Lys Arg Val Ala
              515                    520                    525
Glu Asp Phe Gly Glu Glu Pro Trp Ser Phe Ser Ser Cys Leu Glu Ile
              530                    535                    540
Pro Glu Gly Asp Pro Gly Ala Leu Pro Gly Ala Lys Ala Gly Asp Pro
545                    550                    555                    560
His Leu Asp Tyr Glu Leu Leu Asp Thr Ala Asp Leu Pro Gln Leu Glu
              565                    570                    575
Ser Ser Leu Gln Pro Val Ser Pro Gly Arg Leu Asp Val Ser Glu Ser
              580                    585                    590
Ala Gln Ala Gly Arg Leu Pro Ala Cys Ser Gly Val Leu Met Arg Arg
              595                    600                    605
Arg Pro Ala Arg Arg Ile Leu Ser Gln Val Thr Met Leu Ala Phe Gln
              610                    615                    620
Gly Asp Ala Leu Leu Glu Gln Ile Ser Val Ile Gly Gly Asn Leu Thr
625                    630                    635                    640
Gly Ile Phe Ile His Arg Val Thr Pro Gly Ser Ala Ala Asp Gln Met
              645                    650                    655
Ala Leu Arg Pro Gly Thr Gln Ile Val Met Val Asp Tyr Glu Ala Ser
              660                    665                    670
Glu Pro Leu Phe Lys Ala Val Leu Glu Asp Thr Thr Leu Glu Glu Ala
              675                    680                    685
Val Gly Leu Leu Arg Arg Val Asp Gly Phe Cys Cys Leu Ser Val Lys
              690                    695                    700
Val Asn Thr Asp Gly Tyr Lys Arg Leu Leu Gln Asp Leu Glu Ala Lys
705                    710                    715                    720
Val Ala Thr Ser Gly Asp Ser Phe Tyr Ile Arg Val Asn Leu Ala Met
              725                    730                    735
Glu Gly Arg Ala Lys Gly Glu Leu Gln Val His Cys Asn Glu Val Leu
              740                    745                    750
His Val Thr Asp Thr Met Phe Gln Gly Cys Gly Cys Trp His Ala His
              755                    760                    765
Arg Val Asn Ser Tyr Thr Met Lys Asp Thr Ala Ala His Gly Thr Ile
770                    775                    780
Pro Asn Tyr Ser Arg Ala Gln Gln Gln Leu Ile Ala Leu Ile Gln Asp
785                    790                    795                    800
Met Thr Gln Gln Cys Thr Val Thr Arg Lys Pro Ser Ser Gly Gly Pro
              805                    810                    815
Gln Lys Leu Val Arg Ile Val Ser Met Asp Lys Ala Lys Ala Ser Pro
              820                    825                    830
Leu Arg Leu Ser Phe Asp Arg Gly Gln Leu Asp Pro Ser Arg Met Glu
              835                    840                    845
Gly Ser Ser Thr Cys Phe Trp Ala Glu Ser Cys Leu Thr Leu Val Pro
              850                    855                    860
Tyr Thr Leu Val Arg Pro His Arg Pro Ala Arg Pro Arg Pro Val Leu
865                    870                    875                    880
Leu Val Pro Arg Ala Val Gly Lys Ile Leu Ser Glu Lys Leu Cys Leu
              885                    890                    895
Leu Gln Gly Phe Lys Lys Cys Leu Ala Glu Tyr Leu Ser Gln Glu Glu
              900                    905                    910
Tyr Glu Ala Trp Ser Gln Arg Gly Asp Ile Ile Gln Glu Gly Glu Val
              915                    920                    925
```

```
Ser Gly Gly Arg Cys Trp Val Thr Arg His Ala Val Glu Ser Leu Met
    930                 935                 940
Glu Lys Asn Thr His Ala Leu Leu Asp Val Gln Leu Asp Ser Val Cys
945                 950                 955                 960
Thr Leu His Arg Met Asp Ile Phe Pro Ile Val Ile His Val Ser Val
                965                 970                 975
Asn Glu Lys Met Ala Lys Lys Leu Lys Lys Gly Leu Gln Arg Leu Gly
                980                 985                 990
Thr Ser Glu Glu Gln Leu Leu Glu Ala Ala Arg Gln Glu Glu Gly Asp
                995                 1000                1005
Leu Asp Arg Ala Pro Cys Leu Tyr Ser Ser Leu Ala Pro Asp Gly Trp
    1010                1015                1020
Ser Asp Leu Asp Gly Leu Leu Ser Cys Val Arg Gln Ala Ile Ala Asp
1025                1030                1035                1040
Glu Gln Lys Lys Val Gln Arg Arg Arg His Pro Arg Ile Asn Pro Ser
                1045                1050                1055
Gln Arg Thr Gly Ile Ala Thr Gln Gln Arg Gln Cys His Arg Arg Ile
                1060                1065                1070
Asn Pro Arg Gln Arg Met Gly Ile Ala Thr Gln Gln Arg Gln Cys His
                1075                1080                1085
Arg Arg Ile Asn Pro Ser Gln Arg Thr Gly Ile Thr Thr Gln Gln Cys
    1090                1095                1100
Gln Cys His Arg Arg Ile Asn Pro Ser Gln Arg Thr Gly Ile Ala Met
1105                1110                1115                1120
Pro Ser Ser Ser Asp Thr Leu Lys Lys Asp Lys Leu Leu Pro Arg Asn
                1125                1130                1135
Thr Thr
```

<210> 6
<211> 90
<212> PRT
<213> Artificial Sequence

<220>
<223> consensus sequence

<400> 6
```
Ala Glu Asp Asp Arg Arg Leu Leu Arg Lys Asn Arg Leu Glu Leu Leu
1               5                   10                  15
Gly Glu Leu Thr Leu Ser Gly Leu Leu Asp His Leu Leu Glu Lys Asn
                20                  25                  30
Val Leu Thr Glu Glu Glu Glu Glu Lys Ile Lys Ala Lys Asn Thr Thr
            35                  40                  45
Arg Arg Asp Lys Ala Arg Glu Leu Ile Asp Ser Val Gln Lys Lys Gly
    50                  55                  60
Asn Gln Ala Phe Gly Ile Phe Leu Gln Ala Leu Arg Glu Thr Asp Gly
65                  70                  75                  80
Glu Leu Leu Ala Asp Leu Leu Leu Asp Glu
                85                  90
```

<210> 7
<211> 83
<212> PRT
<213> Artificial Sequence

<220>

<223> consensus sequence

<400> 7
Glu Ile Thr Leu Glu Lys Glu Val Lys Arg Gly Gly Leu Gly Phe Ser
1   5   10   15
Ile Lys Gly Gly Ser Asp Lys Gly Ile Val Val Ser Glu Val Leu Pro
                20   25   30
Gly Ser Gly Ala Ala Glu Ala Gly Gly Arg Leu Lys Glu Gly Asp Val
                35   40   45
Ile Leu Ser Val Asn Gly Gln Asp Val Glu Asn Met Ser His Glu Arg
        50   55   60
Ala Val Leu Ala Ile Lys Gly Ser Gly Gly Glu Val Thr Leu Thr Val
65   70   75   80
Leu Arg Asp

<210> 8
<211> 58
<212> PRT
<213> Artificial Sequence

<220>
<223> consensus sequence

<400> 8
Glu Tyr Val Val Ala Leu Tyr Asp Tyr Glu Ala Gln Asn Glu Asp Glu
1   5   10   15
Leu Ser Phe Lys Lys Gly Asp Ile Ile Thr Val Leu Glu Lys Ser Asp
                20   25   30
Asp Gly Trp Trp Glu Gly Glu Leu Asn Arg Thr Gly Lys Glu Gly Leu
                35   40   45
Phe Pro Ser Asn Tyr Val Glu Glu Ile Glu
        50   55

<210> 9
<211> 108
<212> PRT
<213> Artificial Sequence

<220>
<223> consensus sequence

<400> 9
Thr Arg Pro Val Pro Arg Pro Gly Glu Val Asp Gly Lys Asp Tyr His
1   5   10   15
Phe Val Ser Ser Arg Glu Glu Met Glu Lys Asp Ile Ala Ala Asn Glu
                20   25   30
Phe Leu Glu Tyr Gly Glu Phe Gln Gly Asn Tyr Tyr Gly Thr Ser Leu
                35   40   45
Glu Thr Val Arg Gln Val Ala Lys Gln Gly Lys Ile Cys Ile Leu Asp
        50   55   60
Val Glu Pro Gln Gly Val Lys Arg Leu Arg Thr Ala Glu Leu Ser Asn
65   70   75   80
Pro Ile Val Val Phe Ile Ala Pro Pro Ser Leu Gln Glu Leu Glu Lys
                85   90   95
Arg Leu Glu Gly Arg Asn Lys Glu Ser Glu Glu Ser
                100   105

```
<210> 10
<211> 105
<212> PRT
<213> Artificial Sequence

<220>
<223> consensus sequence

<400> 10
Asp Ser Tyr Gln Lys Ser Ser Gly Asn Ser Ser Leu Trp Glu Ser Asn
1               5                   10                  15
Tyr Gln Asn Trp Gln Gln Glu Ala Ala Lys Leu Lys Ala Gln Ile Glu
            20                  25                  30
Asn Leu Gln Asn Asn Arg Asn Gln Arg His Leu Leu Gly Glu Asp Leu
        35                  40                  45
Gly Ser Leu Ser Leu Lys Glu Leu Gln Gln Leu Glu Gln Gln Leu Glu
    50                  55                  60
Lys Gly Leu Lys His Ile Arg Ser Arg Lys Asn Gln Leu Leu Leu Asp
65                  70                  75                  80
Gln Ile Glu Glu Leu Gln Lys Lys Glu Arg Glu Leu Gln Glu Glu Asn
                85                  90                  95
Lys Ala Leu Arg Lys Lys Ile Glu Glu
                100                 105
```